NARUC Staff Subcommittee on Communications

LOCAL COMPETITION WORK GROUP SUMMARY REPORT

February 1996

Staff Co-Leaders
Charlotte TerKeurst (IL) and Doris McCarter (OH)

Staff Members
Robin Ancona (MI)
Brad Behounek (IL)
Ronald Choura (MI)
Rowland Curry (TX)
Ann Dean (MD)
Sandy Ibaugh (IN)
Debra Kriete (PA)
Sam Loudenslager (AR)
Mary Newmeyer (AL)
Ed Rosenberg (NRRI)
Joel Shifman (ME)

Commissioner Liaison
David W. Rolka (PA)

TABLE OF CONTENTS

THE VIEWS EXPRESSED IN THIS PAPER DO NOT NECESSARILY REPRESENT THE VIEWS OF INDIVIDUAL MEMBERS OF THE LOCAL COMPETITION WORK GROUP, THE AGENCIES THEY REPRESENT, OR THE NATIONAL ASSOCIATION OF REGULATORY UTILITY COMMISSIONERS.

EXECUTIVE SUMMARY

In this report, the Local Competition Work Group (LCWG) has endeavored to consider the myriad of issues associated with the introduction of competition into the local exchange market. Developing a balanced regulatory framework for local competition is a daunting task, but is important because individual policies set in isolation could have unintended results. This report suggests a set of cohesive principles that the LCWG believes would allow economic entry into local telecommunications markets, would not encourage uneconomic entry, and would generally be consistent with other public interest objectives.

The degree to which effective competition may develop in local telecommunications services is not known at this time. Only through removal of regulatory and legal barriers and continued oversight as needed to address imperfections and market failures, can the extent of viable competition be determined. The authors recognize that resolutions different from those offered in this paper could be appropriately adopted and that competition could still develop.

The LCWG views the network of the future to be an intermeshed network of networks, in which each network is allowed to be as robust as any other while the whole construct provides a public utility service. There will be a complex and potentially long transition period as competition develops. Thus, the policies that are appropriate today may need to be modified over time to acknowledge a more competitive market - to the extent it develops. This paper discusses immediate actions to be taken, as well as regulatory changes that may be necessary in the future.

The paper is organized into seven sections: Introduction, Background, Market and Regulatory Principles, Network Regulation, Carrier Regulation, Monitoring/Consumer Safeguards/Service Quality, and a Conclusion.

The Introduction, Background, and Market and Regulatory Principles sections provide context and recommend broad principles that form the basis for many of the recommendations in the remaining sections of the paper. Within the context of the intermeshed network of networks paradigm, the paper recommends that regulations rely on market forces to the extent feasible, not distinguish among carriers absent compelling reasons, and ensure broad customer choice

The Network Regulation section focuses on creating and maintaining a seamless public switched telecommunications network. It discusses the need for unbundled access to network functions, standards to ensure the quality of the network, numbering and number portability issues, interconnection requirements, presubscription and equal access methodologies, signaling responsibilities, shared network and administrative functions, and rights of way facilities issues.

The Carrier Regulation section outlines how carriers should be regulated in terms of certification and basic service offerings, including directory and customer list requirements, E911 and Telecommunications Relay Service provisioning, local service requirements, and tariffing requirements. This section also offers recommendations in the area of rate design and pricing. Included within this area are issues such as the need and principles for cost-based pricing and imputation, carrier-to-carrier and end user pricing and any associated pricing flexibility, resale provisions, tariff unbundling, one-stop shopping, potential end user restrictions, stranded investment, accounting requirements, and structural separations

The Monitoring/Consumer Safeguards/Service Quality section discusses the need for service quality and market status reporting, the potential structure of a universal service fund mechanism and right of way end user concerns.

Overall, due to the minute presence of alternative switched local service providers, and also due to the uncertainty of the long term performance of new entrants in this market (regardless of the size of certain new entrants and their other ventures), changes in the current regulatory requirements for incumbent local exchange companies should be considered very cautiously. Commissions should recognize that some restrictions should be removed only as competition progresses. Factors to consider include the development and subscription to viable interconnection and compensation agreements, demonstrations of viable, existing alternatives, and customer movement from one carrier to another without any functionality or quality losses.

While the incumbent local exchange carriers can not enjoy complete regulatory freedom on the first day a new carrier enters the market, new entrants can not be allowed to enjoy complete regulatory freedom, either. Regardless of the new entrants' size, they can still exert some market power, for example, regarding termination of calls to their customers. Further, some network and service quality regulations should be imposed on new entrants in keeping with the intermeshed network of networks paradigm.

In general, new entrants and incumbent providers should have the same interconnection, unbundling, presubscription, technical, and service quality standards. In other areas, such as service areas, local calling areas, and pricing, the new entrants may enjoy more relaxed regulation without great concern that customers or telecommunications markets would be harmed.

No one knows all the items necessary to permit, or factors affecting the development of, local competition. Emerging issues, such as the possible need for wholesale local service offerings, gained in importance and emphasis as the LCWG work progressed. Undoubtedly other issues will arise that have not been included in this paper. This report is the LCWG's attempt to begin the process of identifying and resolving the currently known issues in opening the local exchange market to healthy competition.

I. INTRODUCTION

For over half of this century, local exchange telephone companies have been treated as utilities with a monopoly within their local service areas. As a result of competition in the long distance market, the development of new technologies such as cellular and personal communications services (PCS), and other factors, the pressure on public policy makers to allow competition for local exchange telephone service has intensified. Within the past two years, state lawmakers and regulators have been working at a seemingly feverish pace to open the local exchange market to competition.

There has been much talk that this work would lead to the "deregulation" of telecommunications. Regulation is certainly changing, with the emphasis switching from economic regulation of monopolies to network regulation to ensure that bottleneck control is not used to the detriment of the more competitive segments of the network. This change, however, does not mean that regulation is being wholly eliminated. Alfred E. Kahn, widely recognized as the "grandfather" of deregulation, has articulated this view:

> The abolition of direct economic regulation is by no means synonymous with *laissez faire*. On the contrary, it may call for government interventions no less vigorous than direct regulation itself, but fundamentally different in character and intent. The progressive realization of this fact in recent years makes for a bifurcated prognosis for the 1990s: the historic trend of direct economic deregulation is unlikely to be reversed, but government will play an increasingly active role in attempting to preserve competition and remedy its imperfections. And that is what it should do.[1]

Professor Eli M. Noam has reached a similar conclusion:

> Some traditional subjects of regulation, such as price and entry controls will become unnecessary. But issues involving free flow of information, interconnectivity, universality of service, and international asymmetry, will not vanish with competition. [Footnote omitted.] Thus, rules and regulations will change, but not disappear entirely. Liberalization does not mean libertarianism.[2]

While the potential for local competition is quite large, current competition in local exchange services is limited, occurring mainly in competitive access services for

---

[1] Alfred E. Kahn, "Deregulation: Looking Backward and Looking Forward," Yale Journal on Regulation, Vol. 7, No. 2, Summer 1990, at 329-330.

[2] Eli M. Noam, "Principles for the Communications Act of 2034: The Superstructure of Infrastructure," Federal Communications Law Journal, Vol. 47, No. 2, at 317.

business services in metropolitan areas. In addition to cost and technological factors, the business case for potential entrants will depend on the extent to which barriers to entry are removed and how regulatory policies treat the incumbents. Further, the type of competition that is attractive may depend on the extent to which regulatory policies, intended or not, favor one type of competition compared to another, e.g., resale vs. facilities-based. The degree to which effective competition may develop in local telecommunications services is not known at this time. Only through removal of regulatory and legal barriers and continued oversight as needed to address imperfections and market failures, can the extent of viable competition be determined.

Developing a balanced regulatory framework for local competition is a daunting task, but is important because individual policies set in isolation could have unintended results. A central goal of the Local Competition Work Group (LCWG) is to describe the broad range of issues that need to be addressed. In addition, this report suggests a set of principles that the LCWG believes would allow economic entry, not encourage uneconomic entry, and generally be consistent with other public interest objectives.

In general, the LCWG recommendations are consistent with Dr. Kahn's conclusion that:

> Our recent experience demonstrates...that free markets may demand governmental interventions just as pervasive and quite possibly more imaginative than direct regulation; but its lesson is that those interventions should to the greatest extent possible preserve, supplement, and enhance competition, rather than suppress it. Finally, to the extent direct economic regulation continues to be required, it is preferable that it be of a kind compatible with competition, rather than obstructive of it.[3]

Section II of this Summary Report provides a background of the LCWG process. Section III recommends broad market and regulatory principles that form the basis for many of the recommendations in the remaining sections of the paper. Section IV focuses on network regulations needed to ensure a seamless public switched telecommunications network. Section V offers recommendations on carrier regulation issues, including pricing regulation, that would be appropriate in a multi-carrier environment. Section VI offers recommendations on monitoring service quality, multi-provider impacts on universal service and right of way considerations. The Conclusion, Section VII, observes the shift away from earnings regulation, the balance required during the shift to competitive markets and the need to incorporate consumer safeguards.

---

[3] Kahn at 353.

II. BACKGROUND

During 1993 and increasingly during 1994, issues relating to local competition were being examined in several NARUC policy subcommittees of the Communications Staff Subcommittee. Discussions during the Summer 1994 Meeting of the Staff Subcommittee on Communications provided the genesis of this project. At that meeting in San Diego, the Communications Staff Subcommittee discussed the need for a more comprehensive and cohesive examination of the issues and for an exploration of broad principles that would assist in assessment of individual components and state filings. This subject was identified as one of the most important areas for study as the Staff developed its study issues for the upcoming year.

Because of that sense of importance the Staff sought and obtained the approval of the Communications Committee to establish a separate work group to address this topic. The LCWG was approved by the Committee at the 1994 NARUC Convention in Reno, Nevada. The goal of the LCWG is *"[t]o identify and address the multitude of issues relating to the introduction of competition into the local exchange."* The objective of the LCWG is *"[t]o issue a report discussing the issues and providing a body of principles that will assist NARUC and its member states in their assessment and implementation of local competition policies and practices."*

The LCWG's initial effort was to: (1) identify the scope of issues surrounding local competition in telephony; (2) compile a bibliography of resource materials; and, (3) develop and distribute an extensive questionnaire on local competition issues to regulators, industry representatives, and other interested parties.

Four sub-groups of issues were established in order to structure the work of the LCWG. The four sub-groups are: (1) barriers to entry; (2) interconnection and network standards; (3)compensation; and (4) regulatory treatment.

Initial drafts of the bibliography and questionnaire were distributed at the 1995 NARUC Winter Meetings and published through the Michigan ERMIS bulletin board system. The finalized questionnaire was distributed in late March. Responses were received during May and June.

Since June 1995, the LCWG has been developing recommendations on each of the topics. The four issue sub-groups published and distributed draft reports at the 1995 NARUC convention in New Orleans. The LCWG requested that interested parties provide comments on the draft reports by December 3, 1995.

The LCWG process has been collaborative and non-adversarial, accepting input from any staff member or interested party. Twenty-one interested parties submitted comments in response to the questionnaire, and seven interested parties provided

comments to the four draft sub-group issue papers. See Appendix B for a listing of these parties. Following receipt of comments on the draft issue papers, the LCWG prepared this Summary Report, finalized the four issue papers, and completed the bibliography including summaries of selected sources. The issue papers and bibliography are being issued separately from this Summary Report. All documents have been posted electronically on the ERMIS electronic bulletin board managed by the Michigan Public Service Commission.

III. COMPETITIVE MARKET AND REGULATORY PRINCIPLES

A. Evolution of the Public Switched Telecommunications Network

The concept of an intermeshed network of networks appears to be the most appropriate paradigm for use in determining details of the regulatory framework for local telecommunications. Broad customer choice should be required to ensure that the public switched telecommunications network functions in the public interest.

It is generally accepted that various existing methods of information transmission will tend toward convergence, in particular, wireline voice and data transmission, cellular and other wireless services, and cable television services. Further, there is increasing overlap and substitutability with other communications segments, such as the print media and broadcast television. Past technological limitations made possible clear legal and regulatory distinctions among the media. However, new developments such as fiber optics, multimedia personal computers, and wireless PCS services are rapidly blurring the technological distinctions and are making the regulatory and legal distinctions less logical and more difficult to enforce. Further, consumers may select or combine services offered by several providers, and service providers may enter into joint ventures, merge, or even divest portions of their networks.

Respondents to the NARUC questionnaire generally agreed that the public switched telecommunications network (PSTN) will evolve according to a "network of networks" concept. A recent study by Professor Phyllis Bernt for the National Regulatory Research Institute (NRRI) addressed the question of the "network of networks" paradigm for telecommunications.[4] Professor Bernt identified four factors that distinguish the network of networks model from the traditional parallel services paradigm:

1. There are different types of providers offering network-based services through the PSTN.

2. All networks connected to the PSTN, regardless of underlying technology, are part of the telecommunications topology.

3. The resulting network of networks provides the ubiquity formerly provided by a single local network.

---

[4] Phyllis Bernt, Regulatory Implications of Alternative Network Models for the Provision of Telecommunications Services, The National Regulatory Research Institute, Columbus, Ohio, October 1994.

4. There is a high degree of customer choice and control.[5]

Professor Bernt noted that, while the term "network of networks" suggests a basic structural approach, the details regarding the components of the network of networks and the specifics of connectivity must still be determined. For guidance, she developed two basic network of networks models. In the linchpin network model, the incumbent local exchange carrier (LEC) portion of the PSTN serves as the linchpin network. The other networks are connected to it and potentially could use it to reach one another, although some of the other networks are connected directly to one another.[6] The incumbent LEC maintains some semblance of a public utility, in that it would be the sole provider of some essential services. Professor Bernt characterizes Ameritech's Customers First proposal and Rochester Telephone Company's new structures as following the linchpin network model.[7]

In the intermeshed network of networks model, the competing networks grow in their ability to compete with the incumbent LECs, so that they provide a full range of services that are good substitutes for incumbent LEC services. Further, they may offer advanced features not available from the LEC. The competing networks may be connected directly to each other. In the intermeshed model, the whole construct provides a public utility service. Because of this concept of a joint public utility responsibility, some of the networks in the intermeshed model may face more regulatory oversight than may be deemed appropriate under the linchpin network model. Professor Bernt states that, under the intermeshed model, regulation should be as symmetrical as possible. However, the increased competitiveness may mean that the net amount of regulation for all network components should be less than that required for the linchpin network model. A key component is that customers have maximum choice and control in picking and choosing desired features, price, and quality of service.[8] It is recognized that the linchpin network model may be viewed as a transition to the intermeshed network model.

Professor Noam has suggested that the network of networks structure will evolve further into a "system of systems," with a new category of "systems integrators" providing the end user with access to a variety of services, in a one-stop fashion.[9] These integrators would relieve customers from needing the expertise to arrange for their own

---

5 Bernt at 14-15.

6 Bernt at 18.

7 Bernt at 22.

8 Bernt at 32-34

9 Eli M. Noam, "Beyond Liberalization: From the Network of Networks to the System of Systems," Telecommunications Policy, 1994 18(4) at 287.

carriers and equipment. They could operate a least-cost-routing system, switching users from carrier to carrier to obtain the best prices for a given time and route, but typically would not be carriers themselves. Professor Noam suggests that domestic and international markets in transmission capacity may emerge, with future options and a spot market. The systems integrators would resemble today's resellers, but they would do much more. He believes that Rochester Telephone Company's R-Com affiliate will offer packages that contain much more than R-Net's services, thus becoming a systems integrator

It is impossible to predict the degree of ubiquity of new entrants' networks. However, a regulatory strategy that treats new entrants only as fringe providers (similar to the linchpin network model) could be self-fulfilling. Regulatory determinations will affect whether the PSTN evolves as a single public network or instead as an interconnected system of discrete, autonomous networks. Thus, the concept of an intermeshed network of networks appears the most appropriate paradigm for use in determining details of the regulatory framework. The regulatory requirements implied by this model can be viewed as the obligations that go with "citizenship" and participation in the PSTN.

The systems integrators suggested by Professor Noam would rely on facilities-based service providers; it is not clear that the emergence of systems integrators would change the basic regulatory framework needs significantly.

B. Regulatory Influence on the PSTN

Regulation should rely on market forces to the extent feasible, and should encourage efficient entry and allow effective competition to develop. Policies must, however, recognize that natural monopoly characteristics may continue to exist in some locales.

In order to not skew outcomes, regulations regarding the physical structure of the PSTN should not distinguish among carriers except where necessary based on technologies. However, some differences in certain regulatory requirements may be appropriate because of other differences among carriers.

As discussed in the Introduction, regulators must continue to play an active role in influencing the structure of the PSTN. Even with the sophisticated "system of systems" he suggests, Professor Noam does not believe that Adam Smith's "invisible hand" will allow government regulation to disappear.[10] A wide range of issues, as discussed throughout this final report and the underlying issue papers, must be addressed.

---

[10] Noam, "Beyond Liberalization..." at 289 and 294.

At the same time, regulators must keep in mind the significant uncertainty regarding how telecommunications will evolve during the next ten to twenty years, and the currently unknown innovations that will undoubtedly occur. As Peter K. Pitsch has argued, it is important to "recognize that predicting what will happen in the Innovation Age, not to mention regulating it, must be undertaken with humility."[11]

As general guidelines, regulation should rely on market forces to the extent feasible, and should encourage efficient entry and allow effective competition to develop, while not trying to manage the market centrally into a preconceived master plan. At the same time, policies must recognize that natural monopoly characteristics may continue to exist in some locales.

In order to not skew outcomes, regulations regarding the physical structure of the PSTN should not distinguish among carriers except where necessary based on technologies used, as a general rule. However, some differences in certain regulatory requirements may be appropriate because of differences among carriers, for example, in the services they offer, market power, or size. Legal requirements, for example, federal preemption of some aspects of state regulation of mobile services, may also require certain distinctions.

C. Consideration of Effects on Incumbent LECs and Universal Service

Local service competition should not be prohibited on the basis of potential effects on the incumbent providers or universal service, nor delayed until Bell Operating Companies receive interLATA relief.

While competitive entry may encroach on an incumbent's sales and may put upward pressure on rates for its remaining services, this result must be weighed against the substantial benefits of competition in encouraging efficiency, promoting innovation, and providing customer choice. Incumbent carriers can be granted flexibility so they can compete more effectively, and steps can be taken to ensure that universal service is not harmed by local competition.

It is possible that incumbent LECs will, over time, suffer some loss of their expected revenue due to competitors. That is a normal consequence of introducing competition in a market. However, incumbent LEC assertions regarding the magnitude of the likely financial impact are likely overstated. There is no credible reason to believe that local competition will threaten the continued ability of incumbents to meet their commitments and obligations. Incumbents will retain important competitive advantages,

---

[11] Peter K. Pitsch, "'Creative Destruction' and the Innovation Age: Lessons for the Telecommunications Industry," Hudson Briefing Paper, No. 179, Hudson Institute, Indianapolis, Indiana, July 1995, at 4.

including customer inertia, ubiquitous networks, and control of bottleneck elements. Further, competition typically brings with it new services and new demand for existing services, so that overall usage increases. The incumbents may be in a position of having a smaller portion of a bigger pie. Any revenue losses are expected to be gradual, so that incumbents will have time to adjust their business plans to reflect the new market conditions.

Common carrier responsibilities have generally included an obligation that rates not be unreasonably discriminatory. In a monopoly environment, this concept has been interpreted to preclude most price discrimination other than, for example, between business and residential customers. Strictly speaking, cost-based price differences are not classified as price discrimination. In a situation with competitive entry, or where a market is contestable, the lack of pricing flexibility can lead to uneconomic entry. Geographically averaged rates can similarly lead to cream-skimming. Responses could include rate deaveraging and/or subsidy deaveraging. Regulators may wish to provide some degree of protection regarding stranded investment as well.

The limits to which pricing flexibility should be granted an incumbent LEC should be considered carefully. One of the arguments in favor of pricing flexibility is that it allows LECs to align rates with costs. However, it should be noted that the concept of Ramsey pricing goes beyond cost-based rate realignments. It is expected that a LEC will seek to rebalance its rates to impose a greater proportion of common costs on those customers less likely to have access to alternatives. From a societal perspective, rebalancing may be a desirable way to deter uneconomic entry.

Expansion of local competition should not be delayed until Bell Operating Company (BOC) interLATA relief is effective. States do not have the jurisdictional authority to provide interLATA relief, and should not deny customers the benefits of increased local competition pending federal action on this matter. Further, both existing Modification of Final Judgment (MFJ) restrictions and pending federal legislative proposals condition interLATA relief on the achievement of some degree of local competition.

Universal service considerations should not prevent or delay the granting of local service certification. Changes to universal service and high cost funding mechanisms may need to be considered separately if there is concern that basic rates may rise as a result of competitive entry. Basic rate increases could occur due to several factors, including the movement to more cost-based or deaveraged rates, diseconomies of scale resulting from reduced demand, or recovery of stranded investment. Universal service and high cost fund subsidies should be recovered through competitively neutral mechanisms, including contributions from new entrants. Review and resolution of universal service issues should be undertaken promptly, before any harm is done. Monitoring of any changes in universal service levels should also begin. Universal service issues are discussed in more detail in Section VI B.

IV. NETWORK REGULATION

A. Infrastructure Requirements

New entrants should not be required to mirror incumbent LEC networks, in terms of exchange boundaries, switching hierarchies, etc. However, certain technical and operational requirements are needed to ensure that the network of networks operates in a seamless fashion.

In general, carriers should be free to structure their networks as they see fit. The networks of new entrants should not be required to mirror incumbent LEC networks, in terms of exchange boundaries, switching hierarchies, etc., since this could significantly reduce the economic efficiency and thus viability of competition. A mirroring requirement would also effectively preclude the incorporation of existing networks such as cable and cellular into the intermeshed network of networks model. Any infrastructure requirements should not foreclose new entrants or discriminate against new technologies. At the same time, several technical and operational requirements, including unbundling, interconnection, access to shared network functionalities, and number portability, are needed to ensure that the network of networks operates in a seamless fashion.

Any expansion of current universal or basic service definitions that would impose infrastructure requirements must be given careful consideration, since infrastructure requirements that do not generate sufficient revenue to cover costs may burden consumers elsewhere. Funding for any such ubiquitous requirements should be structured in a manner that would be competitively neutral. In addition, any expansion of minimum service requirements, e.g., broadband service, should be technology neutral to allow a carrier to choose the most efficient manner of meeting the requirement.

B. Geographic Boundaries

Ideally, the PSTN should have minimal artificial, non-cost based geographic boundaries imposed by regulators. However, the regulatory framework for local competition must be developed in the context of the existing geographic boundaries, and non-cost-based geographic distinctions may continue for public policy reasons. All local telecommunications service providers should be required to publicly disclose their boundaries, along with information regarding the technical configurations needed by connecting companies.

Ideally, the PSTN should have minimal artificial geographic boundaries imposed by regulators. Geographic distinctions based on cost differences may continue to be desirable. In addition, non-cost-based geographic distinctions may continue for public policy reasons, e.g., universal service or community-of-interest concerns. In

general, regulations should not be based on Local Access and Transport Areas (LATA) boundaries, with the obvious exception of the impact of MFJ restrictions on the BOCs. The states and the Federal Communications Commission (FCC) need to coordinate policies to minimize the effect of state boundaries on the PSTN, e.g., to minimize arbitrage and to encourage efficient network design.

It will be a difficult and evolving process to make significant progress toward this principle. Traditiona regulation has been built on a web of geographic boundaries--states, incumbent LEC service areas, LATAs, exchanges, expanded local calling areas, rate bands, and so on--with conflicting policies, different carriers and services, and inconsistent rate designs. Most of the network functions, such as numbering and call routing, are based on the location of customers. While such a structure was sustainable in a monopoly environment, it has lead to a myriad of problems, e.g., rate disparities for similar services, tariff shopping, and cream-skimming (inefficient entry). It is not possible, however, to make a flash-cut change because of factors such as embedded legal distinctions, potential rate shock to customers, customer confusion, and a variety of vested interests.

The following are some examples of the continued importance of geographic boundaries, at least in the near term:

1. InterLATA equal access and intraLATA presubscription are likely to co-exist initially through options such as 2-PIC (primary interexchange carrier). IntraLATA presubscription may also exclude presubscription for local usage, however that is defined. (See Section IV.D.)

2. There may be a need to distinguish between access charges and some other form of compensation for the interchange of calls among incumbent and new LECs with overlapping local service areas, even though the service provided by the terminating LEC is essentially the same whether for termination of local or long distance calls. (See Section V.F.3.)

3. In order to allow billing of calls to their customers to mirror billing of calls to incumbent LECs' customers, some new entrants desire to assign customer numbers using NXXs that mirror incumbent LEC rate centers. On a related issue, telephone numbers may lose their historical geographic significance with the development of number portability. Service provider number portability may be the most desirable and feasible type of number portability in the short term. Service provider portability will restrict number portability within some

defined geographic area such as an incumbent LEC's rate center. (See Section IV.K.2.)

4. Universal service support will continue to be determined based on some geographic demarcations, although the areas may differ from the current study areas (See Section VI.B.)

There appears to be little value in requiring new local service providers to conform their local service areas to the local service areas of the incumbent LECs, as discussed in Section V.C. New entrants may wish to provide calling area options that differ from the incumbents' calling areas, and should be permitted to do so. There may need to be consumer input regarding new service areas.

All local telecommunications service providers should be required to publicly state and publish their PSTN boundaries and their local service areas, along with information regarding technical configurations needed by interconnecting carriers. Up-to-date information needs to be made available electronically to facilitate easy, prompt and readily available access by consumers and other entities such as network providers.

C. Interconnection Requirements

All LECs, including both incumbents and new entrants, should be required to allow other carriers to interconnect to their networks. Carriers should be allowed to interconnect at any logical interconnection point, including meet point interconnections. Technical interconnection requirements and standards should generally not discriminate based on the technologies used, the types of carriers being interconnected, or the services to be provided, unless there are technical factors that require different treatments. Incumbent LECs should offer the same interconnection arrangements to new local service providers (including cellular and PCS) that are used with adjacent LECs or between its own facilities. Interconnection arrangements among LECs and interexchange carriers should also be made consistent, since distinctions between these two types of carriers are quickly disappearing.

Basic network functions must be provided in a uniform manner, where feasible, to conform to quality and interoperability standards. The incumbent must cooperate in the areas of planning, emergency preparedness, directory assistance, ordering, billing, circuit provisioning, maintenance and repair.

Regulators should determine whether the smaller LECs should be exempted from interconnection requirements based on a demonstration of extraordinary circumstances.

It should be transparent to the end user whether their service is being provided by one network provider or multiple providers. Each interconnecting network should follow an established set of guidelines and procedures for identifying and resolving potential problems. The responsibility for monitoring and correcting network problems cannot always be placed on one provider. Rather, these responsibilities and guidelines should be mutually established for all to follow.

Non-discriminatory interconnection of telephone networks is critical to local telephone competition. Competing networks should be interconnected so that customers can seamlessly receive calls that originate on another carrier's network and place calls that terminate on another carrier's network without dialing extra digits and/or paying extra. New market entrants should be interconnected with incumbent providers in a manner that gives them seamless integration into and use of local telephone company signaling and interoffice networks in a manner equivalent to that of the incumbent local telephone company, which includes offerings to affiliates and adjacent LECs.

State regulators will have the responsibility for developing intrastate rules and reviewing intrastate local interconnection tariff filings to determine whether they allow economic competition to develop. These tariffs will include the myriad of arrangements and features that are required to integrate a competitor's network with the LEC network, as well as pricing changes necessary to accommodate a competitive market.

If the intermeshed network of networks paradigm is used, interconnection requirements would be reciprocal among all carriers. There are several arguments in support of this approach, including the following, which may overlap and are in no particular order:

> The local loop is expected to continue to retain some natural monopoly characteristics. Some portions of new entrants' networks are expected to function as bottlenecks, e.g., terminating access and, in some instances, originating access as well.
>
> New entrants that do not provide ubiquitous service get to take advantage of the significant capital investment of incumbent LECs, without having to undertake the investments or incur associated risks. As a result, it is reasonable to require them to reciprocate by allowing interconnection with their networks.

> A seamless network of networks would provide significant positive externalities. The PSTN would be a shared resource, with all networks and users collectively contributing to total economies of scale.[12]
>
> Universal interconnection requirements could allow valuable redundancy and emergency routing capabilities without expensive capital investments.
>
> A carrier's ability to construct facilities and interconnect to another network as desired would allow the carrier to choose the most cost-effective way to access the other network's customers and avoid uneconomic duplication of facilities.

A National Telecommunications and Information Administration (NTIA) study has urged that a concept called universal service access (Advanced USA) be adopted.[13] As described in the NRRI report, Advanced USA would provide access to a host of services offered by providers other than the traditional PSTN providers.[14] Professor Bernt describes some of the customer benefits of such universal access:

> Reciprocity between the [incumbent] LEC and the other network components could be a major issue from the subscriber's perspective...Cellular service is more attractive because it includes access to LEC customers. [Footnote omitted.] The same may prove true for the LEC subscriber. The ability to access a multitude of networks may become a necessary part of LEC service...Just as customers expect the ability to access the LEC network through the cellular network, and *vice versa*, so will customers expect the ability to access these new networks and new services. Reciprocity among networks is necessary to facilitate such customer choice...[15]

NTIA's view is consistent with Professor Bernt's view that:

> The key to assuring open competition, and to lessening the likelihood of noncompetitive behavior, will rest with assuring freedom of customer choice.

---

[12] For a similar view, see Joseph Gillan and Peter Rohrbach, "Reconcentration: A Consequence of Local-exchange Competition?" Fortnightly, July 1, 1994 at 28.

[13] The NTIA Infrastructure Report: Telecommunications in the Age of Information, NTIA, U.S. Department of Commerce, October 1991.

[14] Bernt at 28.

[15] Bernt at 26-27.

If a subscriber on a competitive access provider (CAP) network wishes to access a specific cellular network, but the CAP has a relationship with another cellular provider, the subscriber should be guaranteed equal access to his or her choice.[16]

D. Presubscription and Equal Access

IntraLATA and interLATA presubscription requirements should apply to all local service providers.

IntraLATA presubscription should proceed on its own right and not be held hostage by interLATA relief. The geographic areas subject to presubscription and those areas that are excluded must be carefully considered to assure that the boundaries do not frustrate the achievement of reasonable customer choice of service providers.

A Committee on Standards and Cooperative Practices (CSCP)[17] Subgroup should be established to address the technical and interoperability issues relating to usage subscription and should oversee and mediate any intercarrier dialing parity and access arrangement issues. This could occur on a regional basis for issues that are unique and specific to a region.

IntraLATA presubscription and the issue of whether new local service providers should be required to allow their customers to presubscribe to the interexchange carriers (IXCs) of their choice are currently before state regulators. IntraLATA equal access would provide the same service to IXCs within the LATA that is provided to the IXCs on an interstate or interLATA basis.

IntraLATA presubscription is a logical step in opening local markets to competition. However, each state must consider local conditions and timing issues to determine when intraLATA presubscription is in the public interest. Customers are expected to benefit from being able to choose an intraLATA service provider. If intraLATA revenues are currently being used to support local services, other methods of support should be found that do not create uneconomic barriers to entry.

Four types of intraLATA presubscription are commonly discussed:

---

[16] Bernt at 36.

[17] See Appendix A for a detailed description of the proposed Committee on Standards and Cooperative Practices

1. The 1-PIC arrangement, in which all of the customer's "non-local" calls are carried by the IXC of the customer's choice.

2. The 2-PIC method, in which a customer makes two different choices, one for interLATA calls and one for non-local intraLATA calls.

3. The modified 1-PIC arrangement (also called modified 2-PIC), in which the customer selects either a single IXC to carry both the interLATA and non-local intraLATA calls, or the customer maintains the status quo where the LEC carries intraLATA calls and the IXC carries interMSA calls.

4. A "multi-PIC" or "smart-PIC" arrangement, in which a customer may select any number of different IXCs for different types of calls, or different times of day, or according to other criteria as the customer wishes.

Typically, local calls will continue to be carried by the LEC as they are today. However, it would be possible to design intraLATA presubscription so that all intraLATA calls, including local calls, are carried by the chosen intraLATA carrier. In states where local service is not flat rate and short-haul rates are comparable for LECs and IXCs, it may be desirable to allow presubscription of all intraLATA usage, including local.

The 1-PIC method would eliminate reliance on LATA boundaries, and may be less expensive than the other options. However, it would not allow current dialing arrangements to be maintained, in which the LEC (or the Primary Toll Carrier, in states where such an arrangement is used) carries non-local intraLATA calls. Also, with current disparities between IXC and LEC short-haul rates, the 1-PIC method could mean automatic rate increases unless IXCs implement significant short-haul rate reductions.

The modified 1-PIC method would limit customer choice relative to the 2-PIC method. In states with Primary Toll Carrier arrangements, it could also perpetuate the Primary Toll Carrier structure indefinitely. However, it may be less expensive and may be implemented more quickly than the 2-PIC method.

Overall, the 2-PIC method appears to be the best alternative available at this time. It maximizes customer choice and opens the market to more participants. While it may be somewhat more expensive than other alternatives, the cost is generally not prohibitive. The national trend appears to favor, at a minimum, the 2-PIC method.

As discussed above, calls within a local calling area, which may include extended area service (EAS) areas, may be excluded from presubscription due to current rate designs that may make their inclusion infeasible. Consistent with this arrangement,

local directory assistance, local repair, emergency, local pay-per-call, and operator calls (0+ local and all 0-) would not be subject to presubscription. Calls using the 500, 700, 800, or 900 service access codes would continue to be routed in accordance with the North American Numbering Plan (NANP)

E. Unbundling Requirements

All telephone service providers should be required to unbundle services to the extent requested by other carriers if it is economically reasonable and technically feasible without causing damage to network integrity. Unbundling should be performed in response to a bona fide request in a reasonable amount of time (same as provided to itself or affiliates).

In order to help identify the amount of unbundling that is necessary and to ensure that those unbundled network functions are provided in an integrated manner, a CSCP should be established as described in Appendix A.

Unbundling of local networks can accelerate competitive entry by reducing the capital investment necessary to provide local service. This reduction lowers the overall societal cost of providing telecommunications services by enabling carriers to avoid duplication of other carriers' facilities for which competitive provisioning may not be economically viable. In addition, a new market entrant is not forced to purchase services that it does not want in order to obtain essential telecommunications capabilities.

Both incumbents and new carriers can unbundle their network access lines into at least two components, a loop and a port, as defined below:

Local Loop: A transmission path between the network interface located at a customer's premises and the vertical side of the main distribution frame (or other designated frame) in the central office. Loops are defined by their electrical interfaces rather than by the type of facilities used.

Port: The capability derived from the central office switch hardware and software required to permit customers to transmit or receive information over the public switched networks.

Unbundled loops provide local exchange providers the ability to reach customers by using existing loops rather than by building duplicate facilities. Unbundled ports provide local exchange providers the ability to purchase switch connections to complement their networks. Any further unbundling of the network access lines should be based on factors such as utility, genuine demand, technical feasibility and cost/benefit

relationships. Additional unbundling may be in the public interest. For example, PCS providers may wish to provide the "distribution" function of loop facilities themselves and may need only the "feeder" facilities of the incumbent LEC. In general, it appears reasonable to require LECs to offer interconnection at all logical connection points, including the interface between feeder and distribution plant. Unbundled availability to databases, signaling, and other functionalities is also in the public interest. Configurations other than the loop/port model may develop, such as a local switch platform that includes use of the switch. There are numerous minimum sets of standard operating procedures that are applicable to various types of unbundled loops. These standards are covered in the interconnection and network standards issue sub-group paper that underlies this summary paper.

At a minimum, the large incumbent LECs should be required to unbundle their networks. Consistent with the goals of removing barriers to economic entry and imparting the benefits of competition to all areas, smaller incumbent LECs should also be required to provide unbundled services, elements, and functionalities upon request. Just as entry barriers are not an appropriate way to address concerns regarding universal service, neither should unbundling be restricted to the larger LECs' networks because of concerns about potential revenue losses to smaller LECs.

States should apply unbundling requirements to new entrants as well, for reasons similar to those discussed in Section IV.C., regarding interconnection. Some of their local networks may function as bottlenecks. Particularly if the PSTN is viewed as a shared resource, uniform and extensive unbundling requirements, upon bona fide request, appear appropriate. New entrants may control access to their customers and, absent regulatory restrictions, may be able to exercise that market power, for example, in pricing terminating access. Unbundling requirements may not be necessary if and when effective facilities-based competition emerges.

F. Signaling

Full availability of signaling protocols, the information contained in signaling protocols, and the passage of signaling information between multiple networks should be required.

There is a need for comprehensive network interoperability in a multiple network provider environment so that end user customers perceive the network as being "seamless." To facilitate the passage of signaling information, all carriers, incumbents and new entrants, need to document and provide signaling information necessary for effective carrier interconnection. Access to signaling protocol information should be on a nondiscriminatory basis among the multiple providers.

Although uniform standards do not currently exist for the exchange of signaling protocol information between multiple network providers, these standards may be required in the future to support compatible interconnection arrangements between differing technologies.

G. Shared Network and Administrative Functions

Shared network and administrative functions should be maintained in a competitively neutral fashion, and be available to all qualified (e.g., certified if needed) buyers. The shared network and administrative functions should comply with industry standards.

Providers should participate in governmental network and administration oversight functions, e.g., emergency preparedness, and comply with the complaint resolution standards.

Shared network and administration functions should be part of a daily on-line network, coordinated through a network and administration group.

All information commonly used to make the network routing table function in a competitively neutral manner should be included.

Network security and privacy must be maintained.

Shared network and administration functions must be maintained in a competitively neutral manner, and be available to all qualified providers. However, network security and privacy must be ensured. This administration function is different from day-to-day carrier to carrier interconnection procedural obligations discussed in Section IV.C. above.

Some believe there are significant barriers to effective local competition when interface standards are not in place for essential support areas such as customer provisioning, billing and servicing. It is contended that shared network administration functions provided to new entrants should at least be at parity with what is provided by the LEC to itself. The minimum necessary interfaces defined and referenced in the comments are:

1. Pre-service order - interfaces that support the active use of information the customer representative obtains from systems and the customer to enable a service order to be written, such as feature availability, telephone number and installation scheduling.

2. Provisioning (or Service Ordering) - interfaces that support the actual sending of a service order, the provisioning of that order's attributes in the local switching office or transport plant, and the installation of that service (if necessary) at the customer's premises. This provisioning includes receiving status of the activities, confirmation of completion, or jeopardy reports related to each order.

3. Maintenance - interfaces that support the real time access to all information regarding outages, troubles, etc., and the dispatching of service repair

4. Billing - interfaces that support the transmission of usage recording data between carriers.

5. Customer Account Record Exchange - interfaces that support the Bellcore standard that enables the initiation, maintenance and timely sharing of customer account information between carriers.

To ensure customer privacy and protection against activities such as "slamming" some short delay to verify a change in service provider, i.e., the Letter of Authorization used for IXC changes, could be necessary before a new provider is given read and write access to the databases for a specific customer.

H. Extended Area Service

Standards for EAS should include calling number as well as terminating number information and access to Signaling System Update 7 type of signaling.

The implications of competition on EAS routes must be carefully considered.

EAS may be provided to customers on a flat-rate, usage or banded rate basis, and may require settlements between existing local exchange companies on the basis of access, ownership of facilities, or a sharing of costs. EAS traffic is predominantly carried over dedicated interoffice facilities rather than being carried over combined local and toll facilities. Consequently, traffic on EAS facilities is not measured for billing purposes. Other providers can engage in arbitrage by routing both local and toll traffic over EAS facilities which enables them to avoid paying access and termination charges. To address this concern EAS traffic should be measured in order to identify the originating and terminating points